



SEQUENCE LISTING

<110> Palombella, Vito J.
Liao, Sha-Mei

<120> MEKK1 Molecules and Uses Thereof

<130> 103576.144

<140> US 09/697,898

<141> 2000-10-27

<160> 28

<170> PatentIn version 3.0

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 115 120 125

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Glu Lys Arg Ala Pro Ala Ala Glu Pro Ser Pro Ala Ala Ala Pro Ala
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Gly Arg Glu Met Glu Asn Lys Glu Thr Leu Lys Gly Leu His Lys Met
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Asp Asp Arg Pro Glu Glu Arg Met Ile Arg Glu Lys Leu Lys Ala Thr
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Cys Met Pro Ala Trp Lys His Glu Trp Leu Glu Arg Arg Asn Arg Arg
 195 200 205

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Ser His Asp Phe Tyr Ser His Glu Leu Ser Ser Pro Val Asp Ser Pro						
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Ser Ser Leu Arg Ala Ala Gln Gln Gln Thr Val Gln Gln Gln Pro Leu						
		515		520		525
Ala Gly Ser Arg Arg Asn Gln Glu Ser Asn Phe Asn Leu Thr His Tyr						
		530		535		540

Gly Thr Gln Gln Ile Pro Pro Ala Tyr Lys Asp Leu Ala Glu Pro Trp
 545 550 555 560

Ile Gln Val Phe Gly Met Glu Leu Val Gly Cys Leu Phe Ser Arg Asn
 565 570 575

Trp Asn Val Arg Glu Met Ala Leu Arg Arg Leu Ser His Asp Val Ser
 580 585 590

Gly Ala Leu Leu Leu Ala Asn Gly Glu Ser Thr Gly Asn Ser Gly Gly
 595 600 605

Ser Ser Gly Ser Ser Pro Ser Gly Gly Ala Thr Ser Gly Ser Ser Gln
 610 615 620

Thr Ser Ile Ser Gly Asp Val Val Glu Ala Cys Cys Ser Val Leu Ser
 625 630 635 640

Met Val Cys Ala Asp Pro Val Tyr Lys Val Tyr Val Ala Ala Leu Lys
 645 650 655

Thr Leu Arg Ala Met Leu Val Tyr Thr Pro Cys His Ser Leu Ala Glu
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Arg Ile Lys Leu Gln Arg Leu Leu Gln Pro Val Val Asp Thr Ile Leu
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Val Lys Cys Ala Asp Ala Asn Ser Arg Thr Ser Gln Leu Ser Ile Ser
 690 695 700

Thr Leu Leu Glu Leu Cys Lys Gly Gln Ala Gly Glu Leu Ala Val Gly
 705 710 715 720

Arg Glu Ile Leu Lys Ala Gly Ser Ile Gly Ile Gly Gly Val Asp Tyr
 725 730 735

Val Leu Asn Cys Ile Leu Gly Asn Gln Thr Glu Ser Asn Asn Trp Gln
 740 745 750

Glu Leu Leu Gly Arg Leu Cys Leu Ile Asp Arg Leu Leu Leu Glu Phe
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Pro Ala Glu Phe Tyr Pro His Ile Val Ser Thr Asp Val Ser Gln Ala
 770 775 780

Glu Pro Val Glu Ile Arg Tyr Lys Lys Leu Leu Ser Leu Leu Thr Phe
 785 790 795 800

Ala Leu Gln Ser Ile Asp Asn Ser His Ser Met Val Gly Lys Leu Ser
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Arg Arg Ile Tyr Leu Ser Ser Ala Arg Met Val Thr Thr Val Pro His
 820 825 830

Val Phe Ser Lys Leu Leu Glu Met Leu Ser Val Ser Ser Ser Thr His
 835 840 845

Phe Thr Arg Met Arg Arg Arg Leu Met Ala Ile Ala Asp Glu Val Glu
 850 855 860

Ile Ala Glu Ala Ile Gln Leu Gly Val Glu Asp Thr Leu Asp Gly Gln
 865 870 875 880

Gln Asp Ser Phe Leu Gln Ala Ser Val Pro Asn Asn Tyr Leu Glu Thr
 885 890 895

Thr Glu Asn Ser Ser Pro Glu Cys Thr Val His Leu Glu Lys Thr Gly
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Lys Gly Leu Cys Ala Thr Lys Leu Ser Ala Ser Ser Glu Asp Ile Ser
 915 920 925

Glu Arg Leu Ala Ser Ile Ser Val Gly Pro Ser Ser Ser Thr Thr Thr
 930 935 940

Thr Thr Thr Thr Thr Glu Gln Pro Lys Pro Met Val Gln Thr Lys Gly
 945 950 955 960

Arg Pro His Ser Gln Cys Leu Asn Ser Ser Pro Leu Ser His His Ser
 965 970 975

Gln Leu Met Phe Pro Ala Leu Ser Thr Pro Ser Ser Ser Thr Pro Ser
 980 985 990

Val Pro Ala Gly Thr Ala Thr Asp Val Ser Lys His Arg Leu Gln Gly
 995 1000 1005

Phe Ile Pro Cys Arg Ile Pro Ser Ala Ser Pro Gln Thr Gln Arg

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Ser Asp Lys Leu Ser Pro Val 1040	Phe Thr Gln Ser 1045	Arg Pro Leu Pro 1050
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Asn Thr Ser Lys Gln Gly Asp 1070	Pro Ser Lys Asn 1075	Ser Met Thr Leu 1080
Asp Leu Asn Ser Ser Ser Lys 1085	Cys Asp Asp Ser 1090	Phe Gly Cys Ser 1095
Ser Asn Ser Ser Asn Ala Val 1100	Ile Pro Ser Asp 1105	Glu Thr Val Phe 1110
Thr Pro Val Glu Glu Lys Cys 1115	Arg Leu Asp Val 1120	Asn Thr Glu Leu 1125
Asn Ser Ser Ile Glu Asp Leu 1130	Leu Glu Ala Ser 1135	Met Pro Ser Ser 1140
Asp Thr Thr Val Thr Phe Lys 1145	Ser Glu Val Ala 1150	Val Leu Ser Pro 1155
Glu Lys Ala Glu Asn Asp Asp 1160	Thr Tyr Lys Asp 1165	Asp Val Asn His 1170
Asn Gln Lys Cys Lys Glu Lys 1175	Met Glu Ala Glu 1180	Glu Glu Glu Ala 1185
Leu Ala Ile Ala Met Ala Met 1190	Ser Ala Ser Gln 1195	Asp Ala Leu Pro 1200
Ile Val Pro Gln Leu Gln Val 1205	Glu Asn Gly Glu 1210	Asp Ile Ile Ile 1215
Ile Gln Gln Asp Thr Pro Glu 1220	Thr Leu Pro Gly 1225	His Thr Lys Ala 1230

Lys	Gln	Pro	Tyr	Arg	Glu	Asp	Thr	Glu	Trp	Leu	Lys	Gly	Gln	Gln
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Ile	Gly	Leu	Gly	Ala	Phe	Ser	Ser	Cys	Tyr	Gln	Ala	Gln	Asp	Val
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Gly	Thr	Gly	Thr	Leu	Met	Ala	Val	Lys	Gln	Val	Thr	Tyr	Val	Arg
1265						1270					1275			
Asn	Thr	Ser	Ser	Glu	Gln	Glu	Glu	Val	Val	Glu	Ala	Leu	Arg	Glu
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Glu	Ile	Arg	Met	Met	Ser	His	Leu	Asn	His	Pro	Asn	Ile	Ile	Arg
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Met	Leu	Gly	Ala	Thr	Cys	Glu	Lys	Ser	Asn	Tyr	Asn	Leu	Phe	Ile
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Glu	Trp	Met	Ala	Gly	Gly	Ser	Val	Ala	His	Leu	Leu	Ser	Lys	Tyr
1325						1330					1335			
Gly	Ala	Phe	Lys	Glu	Ser	Val	Val	Ile	Asn	Tyr	Thr	Glu	Gln	Leu
1340						1345					1350			
Leu	Arg	Gly	Leu	Ser	Tyr	Leu	His	Glu	Asn	Gln	Ile	Ile	His	Arg
1355						1360					1365			
Asp	Val	Lys	Gly	Ala	Asn	Leu	Leu	Ile	Asp	Ser	Thr	Gly	Gln	Arg
1370						1375					1380			
Leu	Arg	Ile	Ala	Asp	Phe	Gly	Ala	Ala	Ala	Arg	Leu	Ala	Ser	Lys
1385						1390					1395			
Gly	Thr	Gly	Ala	Gly	Glu	Phe	Gln	Gly	Gln	Leu	Leu	Gly	Thr	Ile
1400						1405					1410			
Ala	Phe	Met	Ala	Pro	Glu	Val	Leu	Arg	Gly	Gln	Gln	Tyr	Gly	Arg
1415						1420					1425			
Ser	Cys	Asp	Val	Trp	Ser	Val	Gly	Cys	Ala	Ile	Ile	Glu	Met	Ala
1430						1435					1440			
Cys	Ala	Lys	Pro	Pro	Trp	Asn	Ala	Glu	Lys	His	Ser	Asn	His	Leu
1445						1450					1455			

Ala Leu Ile Phe Lys Ile Ala Ser Ala Thr Thr Ala Pro Ser Ile
 1460 1465 1470

Pro Ser His Leu Ser Pro Gly Leu Arg Asp Val Ala Leu Arg Cys
 1475 1480 1485

Leu Glu Leu Gln Pro Gln Asp Arg Pro Pro Ser Arg Glu Leu Leu
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Lys His Pro Val Phe Arg Thr Thr Trp
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Val Glu Leu Asp Gln Leu Pro Glu Gln Pro Leu Phe Leu Ala Ala Ser
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Pro Pro Ala Ser Ser Thr Ser Pro Ser Pro Glu Pro Ala Asp Ala Ala
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Gly Ser Gly Thr Gly Phe Gln Pro Val Ala Val Pro Pro Pro His Gly
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Ala Ala Ser Arg Arg Gly Ala His Leu Thr Glu Ser Val Ala Ala Pro
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Asp Ser Gly Ala Ser Ser Pro Ala Ala Ala Glu Pro Gly Glu Lys Arg
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Ala Pro Ala Ala Glu Pro Ser Pro Ala Ala Ala Pro Ala Gly Arg Glu
 130 135 140

Met Glu Asn Lys Glu Thr Leu Lys Gly Leu His Lys Met Asp Asp Arg
 145 150 155 160

Pro Glu Glu Arg Met Ile Arg Glu Lys Leu Lys Ala Thr Cys Met Pro
 165 170 175

Ala Trp Lys His Glu Trp Leu Glu Arg Arg Asn Arg Arg Gly Pro Val

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Arg Ala Ala Gln Gln Gln Thr Val Gln Gln Gln Pro Leu Ala Gly Ser
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 Arg Arg Asn Gln Glu Ser Asn Phe Asn Leu Thr His Tyr Gly Thr Gln
 515 520 525
 Gln Ile Pro Pro Ala Tyr Lys Asp Leu Ala Glu Pro Trp Ile Gln Val
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 565 570 575
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 580 585 590
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 595 600 605
 Ser Gly Asp Val Val Glu Ala Cys Cys Ser Val Leu Ser Met Val Cys
 610 615 620
 Ala Asp Pro Val Tyr Lys Val Tyr Val Ala Ala Leu Lys Thr Leu Arg
 625 630 635 640
 Ala Met Leu Val Tyr Thr Pro Cys His Ser Leu Ala Glu Arg Ile Lys
 645 650 655
 Leu Gln Arg Leu Leu Gln Pro Val Val Asp Thr Ile Leu Val Lys Cys
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 Ala Asp Ala Asn Ser Arg Thr Ser Gln Leu Ser Ile Ser Thr Leu Leu
 675 680 685
 Glu Leu Cys Lys Gly Gln Ala Gly Glu Leu Ala Val Gly Arg Glu Ile
 690 695 700
 Leu Lys Ala Gly Ser Ile Gly Ile Gly Gly Val Asp Tyr Val Leu Asn
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 Cys Ile Leu Gly Asn Gln Thr Glu Ser Asn Asn Trp Gln Glu Leu Leu
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 Gly Arg Leu Cys Leu Ile Asp Arg Leu Leu Leu Glu Phe Pro Ala Glu
 740 745 750
 Phe Tyr Pro His Ile Val Ser Thr Asp Val Ser Gln Ala Glu Pro Val
 755 760 765
 Glu Ile Arg Tyr Lys Lys Leu Leu Ser Leu Leu Thr Phe Ala Leu Gln
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 Ser Ile Asp Asn Ser His Ser Met Val Gly Lys Leu Ser Arg Arg Ile
 785 790 795 800
 Tyr Leu Ser Ser Ala Arg Met Val Thr Thr Val Pro His Val Phe Ser

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Ser	Ile	Glu	Asp	Leu	Leu	Glu	Ala	Ser	Met	Pro	Ser	Ser	Asp	Thr
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Thr	Val	Thr	Phe	Lys	Ser	Glu	Val	Ala	Val	Leu	Ser	Pro	Glu	Lys
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Lys	Cys	Lys	Glu	Lys	Met	Glu	Ala	Glu	Glu	Glu	Glu	Ala	Leu	Ala
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Pro	Tyr	Arg	Glu	Asp	Thr	Glu	Trp	Leu	Lys	Gly	Gln	Gln	Ile	Gly
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Leu	Gly	Ala	Phe	Ser	Ser	Cys	Tyr	Gln	Ala	Gln	Asp	Val	Gly	Thr
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Gly	Thr	Leu	Met	Ala	Val	Lys	Gln	Val	Thr	Tyr	Val	Arg	Asn	Thr
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Ser	Ser	Glu	Gln	Glu	Glu	Val	Val	Glu	Ala	Leu	Arg	Glu	Glu	Ile
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Arg	Met	Met	Ser	His	Leu	Asn	His	Pro	Asn	Ile	Ile	Arg	Met	Leu
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Gly	Ala	Thr	Cys	Glu	Lys	Ser	Asn	Tyr	Asn	Leu	Phe	Ile	Glu	Trp
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Met	Ala	Gly	Gly	Ser	Val	Ala	His	Leu	Leu	Ser	Lys	Tyr	Gly	Ala
1310						1315					1320			
Phe	Lys	Glu	Ser	Val	Val	Ile	Asn	Tyr	Thr	Glu	Gln	Leu	Leu	Arg
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Gly	Leu	Ser	Tyr	Leu	His	Glu	Asn	Gln	Ile	Ile	His	Arg	Asp	Val
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Lys	Gly	Ala	Asn	Leu	Leu	Ile	Asp	Ser	Thr	Gly	Gln	Arg	Leu	Arg
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Ile	Ala	Asp	Phe	Gly	Ala	Ala	Ala	Arg	Leu	Ala	Ser	Lys	Gly	Thr
1370						1375					1380			
Gly	Ala	Gly	Glu	Phe	Gln	Gly	Gln	Leu	Leu	Gly	Thr	Ile	Ala	Phe
1385						1390					1395			
Met	Ala	Pro	Glu	Val	Leu	Arg	Gly	Gln	Gln	Tyr	Gly	Arg	Ser	Cys

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 Lys Pro Pro Trp Asn Ala Glu Lys His Ser Asn His Leu Ala Leu
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 His Leu Ser Pro Gly Leu Arg Asp Val Ala Leu Arg Cys Leu Glu
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 Pro Pro Gly Ala Ala Ser Arg Cys Gly Ser His Ser Ala Glu Leu Ala
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 Lys Gly Leu His Lys Met Asp Asp Arg Pro Glu Glu Arg Met Ile Arg

165								170					175		
Glu	Lys	Leu	Lys 180	Ala	Thr	Cys	Met	Pro 185	Ala	Trp	Lys	His	Glu 190	Trp	Leu
Glu	Arg	Arg 195	Asn	Arg	Arg	Gly	Pro 200	Val	Val	Val	Lys	Pro 205	Ile	Pro	Ile
Lys	Gly 210	Asp	Gly	Ser	Glu	Met 215	Ser	Asn	Leu	Ala	Ala 220	Glu	Leu	Gln	Gly
Glu 225	Gly	Gln	Ala	Gly	Ser 230	Ala	Ala	Pro	Ala	Pro 235	Lys	Gly	Arg	Arg	Ser 240
Pro	Ser	Pro	Gly	Ser 245	Ser	Pro	Ser	Gly	Arg 250	Ser	Gly	Lys	Pro	Glu 255	Ser
Pro	Gly	Val	Arg 260	Arg	Lys	Arg	Val	Ser 265	Pro	Val	Pro	Phe	Gln 270	Ser	Gly
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Leu 305	Tyr	Leu	Leu	Gln	Gln 310	Ile	Gly	Pro	Asn	Ser 315	Phe	Leu	Ile	Gly	Gly 320
Asp	Ser	Pro	Asp	Asn 325	Lys	Tyr	Arg	Val	Phe 330	Ile	Gly	Pro	Gln	Asn 335	Cys
Ser	Cys	Gly	Arg 340	Gly	Thr	Phe	Cys	Ile 345	His	Leu	Leu	Phe	Val 350	Met	Leu
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Arg 385	Ser	Ser	Arg	Ile	Lys 390	Ala	Pro	Ser	Arg	Asn 395	Thr	Ile	Gln	Lys	Phe 400
Val	Ser	Arg	Met	Ser 405	Asn	Cys	His	Thr	Leu 410	Ser	Ser	Ser	Ser	Thr 415	Ser
Thr	Ser	Ser	Ser 420	Glu	Asn	Ser	Ile	Lys 425	Asp	Glu	Glu	Glu	Gln 430	Met	Cys
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Arg Ser Lys Trp Arg Ser His Asp Phe Tyr Ser His Glu Leu Ser Ser
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 Cys Leu Phe Ser Arg Asn Trp Asn Val Arg Glu Met Ala Leu Arg Arg
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 645 650 655
 Cys His Ser Leu Ala Glu Arg Ile Lys Leu Gln Arg Leu Leu Arg Pro
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 Val Val Asp Thr Ile Leu Val Lys Cys Ala Asp Ala Asn Ser Arg Thr
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 Ser Gln Leu Ser Ile Ser Thr Leu Leu Glu Leu Cys Lys Gly Gln Ala
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 Glu Ser Asn Asn Trp Gln Glu Leu Leu Gly Arg Leu Cys Leu Ile Asp
 740 745 750
 Arg Leu Leu Leu Glu Ile Ser Ala Glu Phe Tyr Pro His Ile Val Ser
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 Thr Asp Val Ser Gln Ala Glu Pro Val Glu Ile Arg Tyr Lys Lys Leu
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Val Thr Thr Val Pro Pro Leu Phe Ser Lys Leu Val Thr Met Leu Ser						
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Ile Ala Asp Glu Val Glu Ile Ala Glu Val Ile Gln Leu Gly Ser Glu						
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Asp Thr Leu Asp Gly Gln Gln Asp Ser Ser Gln Ala Leu Ala Pro Pro						
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				875		880
Arg Tyr Pro Glu Ser Ser Ser Leu Glu His Thr Ala His Val Glu Lys						
		885		890		895
Thr Gly Lys Gly Leu Lys Ala Thr Arg Leu Ser Ala Ser Ser Glu Asp						
		900		905		910
Ile Ser Asp Arg Leu Ala Gly Val Ser Val Gly Leu Pro Ser Ser Ala						
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Thr Thr Glu Gln Pro Lys Pro Thr Val Gln Thr Lys Gly Arg Pro His						
		930		935		940
Ser Gln Cys Leu Asn Ser Ser Pro Leu Ser Pro Pro Gln Leu Met Phe						
		945		950		955
				955		960
Pro Ala Ile Ser Ala Pro Cys Ser Ser Ala Pro Ser Val Pro Ala Gly						
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Ser Val Thr Asp Ala Ser Lys His Arg Pro Arg Ala Phe Val Pro Cys						
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Lys Ile Pro Ser Ala Ser Pro Gln Thr Gln Arg Lys Phe Ser Leu Gln						
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Phe Gln Arg Thr Cys Ser Glu Asn Arg Asp Ser Glu Lys Leu Ser						
		1010		1015		1020
Pro Val Phe Thr Gln Ser Arg Pro Pro Pro Ser Ser Asn Ile His						
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Arg Ala Lys Ala Ser Arg Pro Val Pro Gly Ser Thr Ser Lys Leu						
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Ala Val Ile Pro Ser Glu Glu Thr Ala Phe Thr Pro Ala Glu Asp						
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Phe	Lys	Ser	Glu	Val	Ala	Val	Leu	Ser	Pro	Glu	Lys	Ala	Glu	Ser
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Pro	Glu	Thr	Leu	Pro	Gly	His	Thr	Lys	Ala	Asn	Glu	Pro	Tyr	Arg
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Tyr	Leu	His	Glu	Asn	Gln	Ile	Ile	His	Arg	Asp	Val	Lys	Gly	Ala
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 Ser Ala Glu Leu Ala Ala Ala Arg Asp Ser Gly Ala Arg Ser Pro Ala
 130 135 140
 Gly Ala Glu Pro Pro Ser Ala Ala Ala Pro Ser Gly Arg Glu Met Glu

145		150		155		160
Asn Lys Glu Thr	Leu Lys Gly Leu His	Lys Met Glu Asp Arg	Pro Glu			
	165	170	175			
Glu Arg Met Ile	Arg Glu Lys Leu Lys Ala Thr Cys Met	Pro Ala Trp				
	180	185	190			
Lys His Glu Trp	Leu Glu Arg Arg Asn Arg Arg Gly	Pro Val Val Val				
	195	200	205			
Lys Pro Ile Pro	Ile Lys Gly Asp Gly Ser Glu Val Asn Asn Leu Ala					
	210	215	220			
Ala Glu Pro Gln Gly	Glu Gly Gln Ala Gly Ser Ala Ala Pro Ala Pro					
225	230	235	240			
Lys Gly Arg Arg	Ser Pro Ser Pro Gly Ser Ser Pro Ser Gly Arg Ser					
	245	250	255			
Val Lys Pro Glu	Ser Pro Gly Val Arg Arg Lys Arg Val Ser Pro Val					
	260	265	270			
Pro Phe Gln Ser	Gly Arg Ile Thr Pro Pro Arg Arg Ala Pro Ser Pro					
	275	280	285			
Asp Gly Phe Ser	Pro Tyr Ser Pro Glu Glu Thr Ser Arg Arg Val Asn					
	290	295	300			
Lys Val Met Arg	Ala Arg Leu Tyr Leu Leu Gln Gln Ile Gly Pro Asn					
	305	310	315	320		
Ser Phe Leu Ile	Gly Gly Asp Ser Pro Asp Asn Lys Tyr Arg Val Phe					
	325	330	335			
Ile Gly Pro Gln	Asn Cys Ser Cys Gly Arg Gly Ala Phe Cys Ile His					
	340	345	350			
Leu Leu Phe Val	Met Leu Arg Val Phe Gln Leu Glu Pro Ser Asp Pro					
	355	360	365			
Met Leu Trp Arg	Lys Thr Leu Lys Asn Phe Glu Val Glu Ser Leu Phe					
	370	375	380			
Gln Lys Tyr His	Ser Arg Arg Ser Ser Arg Ile Lys Ala Pro Ser Arg					
	385	390	395	400		
Asn Thr Ile Gln	Lys Phe Val Ser Arg Met Ser Asn Ser His Thr Leu					
	405	410	415			
Ser Ser Ser Ser	Thr Ser Thr Ser Ser Ser Glu Asn Ser Ile Lys Asp					
	420	425	430			
Glu Glu Glu Gln	Met Cys Pro Ile Cys Leu Leu Gly Met Leu Asp Glu					
	435	440	445			
Glu Ser Leu Thr	Val Cys Glu Asp Gly Cys Arg Asn Lys Leu His His					
	450	455	460			

His Cys Met Ser Ile Trp Ala Glu Glu Cys Arg Arg Asn Arg Glu Pro
 465 470 475 480
 Leu Ile Cys Pro Leu Cys Arg Ser Trp Arg Ser His Asp Phe Tyr Ser
 485 490 495
 His Glu Leu Ser Ser Pro Val Glu Ser Pro Ala Ser Leu Arg Ala Val
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 Gln Gln Pro Ser Ser Pro Gln Gln Pro Val Ala Gly Ser Gln Arg Arg
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 Asn Gln Glu Ser Ser Phe Asn Leu Thr His Phe Gly Thr Gln Gln Ile
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 Pro Ser Ala Tyr Lys Asp Leu Ala Glu Pro Trp Ile Gln Val Phe Gly
 545 550 555 560
 Met Glu Leu Val Gly Cys Leu Phe Ser Arg Asn Trp Asn Val Arg Glu
 565 570 575
 Met Ala Leu Arg Arg Leu Ser His Asp Val Ser Gly Ala Leu Leu Leu
 580 585 590
 Ala Asn Gly Glu Ser Thr Gly Asn Ser Gly Gly Gly Ser Gly Gly Ser
 595 600 605
 Leu Ser Ala Gly Ala Ala Ser Gly Ser Ser Gln Pro Ser Ile Ser Gly
 610 615 620
 Asp Val Val Glu Ala Cys Cys Ser Val Leu Ser Ile Val Cys Ala Asp
 625 630 635 640
 Pro Val Tyr Lys Val Tyr Val Ala Ala Leu Lys Thr Leu Arg Ala Met
 645 650 655
 Leu Val Tyr Thr Pro Cys His Ser Leu Ala Glu Arg Ile Lys Leu Gln
 660 665 670
 Arg Leu Leu Arg Pro Val Val Asp Thr Ile Leu Val Lys Cys Ala Asp
 675 680 685
 Ala Asn Ser Arg Thr Ser Gln Leu Ser Ile Ser Thr Val Leu Glu Leu
 690 695 700
 Cys Lys Gly Gln Ala Gly Glu Leu Ala Val Gly Arg Glu Ile Leu Lys
 705 710 715 720
 Ala Gly Ser Ile Gly Val Gly Gly Val Asp Tyr Val Leu Ser Cys Ile
 725 730 735
 Leu Gly Asn Gln Ala Glu Ser Asn Asn Trp Gln Glu Leu Leu Gly Arg
 740 745 750
 Leu Cys Leu Ile Asp Arg Leu Leu Leu Glu Phe Pro Ala Glu Phe Tyr
 755 760 765
 Pro His Ile Val Ser Thr Asp Val Ser Gln Ala Glu Pro Val Glu Ile

770	775	780
Arg Tyr Lys Lys Leu Leu Ser Leu Leu Thr Phe Ala Leu Gln Ser Ile 785 790 795 800		
Asp Asn Ser His Ser Met Val Gly Lys Leu Ser Arg Arg Ile Tyr Leu 805 810 815		
Ser Ser Ala Arg Met Val Thr Ala Val Pro Ala Val Phe Ser Lys Leu 820 825 830		
Val Thr Met Leu Asn Ala Ser Gly Ser Thr His Phe Thr Arg Met Arg 835 840 845		
Arg Arg Leu Met Ala Ile Ala Asp Glu Val Glu Ile Ala Glu Val Ile 850 855 860		
Gln Leu Gly Val Glu Asp Thr Val Asp Gly His Gln Asp Ser Leu Gln 865 870 875 880		
Ala Val Ala Pro Thr Ser Cys Leu Glu Asn Ser Ser Leu Glu His Thr 885 890 895		
Val His Arg Glu Lys Thr Gly Lys Gly Leu Ser Ala Thr Arg Leu Ser 900 905 910		
Ala Ser Ser Glu Asp Ile Ser Asp Arg Leu Ala Gly Val Ser Val Gly 915 920 925		
Leu Pro Ser Ser Thr Thr Thr Glu Gln Pro Lys Pro Ala Val Gln Thr 930 935 940		
Lys Gly Arg Pro His Ser Gln Cys Leu Asn Ser Ser Pro Leu Ser His 945 950 955 960		
Ala Gln Leu Met Phe Pro Ala Pro Ser Ala Pro Cys Ser Ser Ala Pro 965 970 975		
Ser Val Pro Asp Ile Ser Lys His Arg Pro Gln Ala Phe Val Pro Cys 980 985 990		
Lys Ile Pro Ser Ala Ser Pro Gln Thr Gln Arg Lys Phe Ser Leu Gln 995 1000 1005		
Phe Gln Arg Asn Cys Ser Glu His Arg Asp Ser Asp Gln Leu Ser 1010 1015 1020		
Pro Val Phe Thr Gln Ser Arg Pro Pro Pro Ser Ser Asn Ile His 1025 1030 1035		
Arg Pro Lys Pro Ser Arg Pro Val Pro Gly Ser Thr Ser Lys Leu 1040 1045 1050		
Gly Asp Ala Thr Lys Ser Ser Met Thr Leu Asp Leu Gly Ser Ala 1055 1060 1065		
Ser Arg Cys Asp Asp Ser Phe Gly Gly Gly Gly Asn Ser Gly Asn 1070 1075 1080		

Ala Val	Ile Pro Ser Asp	Glu Thr Val Phe Thr	Pro Val Glu Asp
1085		1090	1095
Lys Cys	Arg Leu Asp Val	Asn Thr Glu Leu Asn	Ser Ser Ile Glu
1100		1105	1110
Asp Leu	Leu Glu Ala Ser	Met Pro Ser Ser Asp	Thr Thr Val Thr
1115		1120	1125
Phe Lys	Ser Glu Val Ala	Val Leu Ser Pro Glu	Lys Ala Glu Asn
1130		1135	1140
Asp Asp	Thr Tyr Lys Asp	Asp Val Asn His Asn	Gln Lys Cys Lys
1145		1150	1155
Glu Lys	Met Glu Ala Glu	Glu Glu Glu Ala Leu	Ala Ile Ala Met
1160		1165	1170
Ala Met	Ser Ala Ser Gln	Asp Ala Leu Pro Ile	Val Pro Gln Leu
1175		1180	1185
Gln Val	Glu Asn Gly Glu	Asp Ile Ile Ile Ile	Gln Gln Asp Thr
1190		1195	1200
Pro Glu	Thr Leu Pro Gly	His Thr Lys Ala Lys	Gln Pro Tyr Arg
1205		1210	1215
Glu Asp	Ala Glu Trp Leu	Lys Gly Gln Gln Ile	Gly Leu Gly Ala
1220		1225	1230
Phe Ser	Ser Cys Tyr Gln	Ala Gln Asp Val Gly	Thr Gly Thr Leu
1235		1240	1245
Met Ala	Val Lys Gln Val	Thr Tyr Val Arg Asn	Thr Ser Ser Glu
1250		1255	1260
Gln Glu	Glu Val Val Glu	Ala Leu Arg Glu Glu	Ile Arg Met Met
1265		1270	1275
Gly His	Leu Asn His Pro	Asn Ile Ile Arg Met	Leu Gly Ala Thr
1280		1285	1290
Cys Glu	Lys Ser Asn Tyr	Asn Leu Phe Ile Glu	Trp Met Ala Gly
1295		1300	1305
Gly Ser	Val Ala His Leu	Leu Ser Lys Tyr Gly	Ala Phe Lys Glu
1310		1315	1320
Ser Val	Val Ile Asn Tyr	Thr Glu Gln Leu Leu	Arg Gly Leu Ser
1325		1330	1335
Tyr Leu	His Glu Asn Gln	Ile Ile His Arg Asp	Val Lys Gly Ala
1340		1345	1350
Asn Leu	Leu Ile Asp Ser	Thr Gly Gln Arg Leu	Arg Ile Ala Asp
1355		1360	1365
Phe Gly	Ala Ala Ala Arg	Leu Ala Ser Lys Gly	Thr Gly Ala Gly

1370		1375		1380
Glu Phe Gln Gly Gln Leu Leu Gly Thr Ile Ala Phe Met Ala Pro				
1385		1390		1395
Glu Val Leu Arg Gly Gln Gln Tyr Gly Arg Ser Cys Asp Val Trp				
1400		1405		1410
Ser Val Gly Cys Ala Ile Ile Glu Met Ala Cys Ala Lys Pro Pro				
1415		1420		1425
Trp Asn Ala Glu Lys His Ser Asn His Leu Ala Leu Ile Phe Lys				
1430		1435		1440
Ile Ala Ser Ala Thr Thr Ala Pro Ser Ile Pro Ser His Leu Ser				
1445		1450		1455
Pro Gly Leu Arg Asp Val Ala Val Arg Cys Leu Glu Leu Gln Pro				
1460		1465		1470
Gln Asp Arg Pro Pro Ser Arg Glu Leu Leu Lys His Pro Val Phe				
1475		1480		1485
Arg Thr Thr Trp				
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His Thr Lys Ala Lys Gln Pro Tyr Arg Glu Asp Thr
 35 40